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CLAIMS

1. A method of joining plastic-lined conduits comprising the following steps, not necessarily in the following order:

- providing a first conduit and a second conduit, each conduit comprising a wall of metal defining a bore having an open end for connection and being substantially lined by a plastic liner, the liner ending within the bore to leave a short unlined section at the open end of the conduit;
- arranging said first and second conduits with their ends abutting;
- welding said ends together to form a longer conduit;
- providing a tubular bridging member of corrosion-resistant material dimensioned to fit inside the lined conduits, the bridging member having a first sealing portion toward one end thereof and a second sealing portion toward the second end, said sealing portions being interconnected by an intermediate portion, the length of said intermediate portion being sufficient to bridge the unlined portions of the abutting first and second conduits while the first and second sealing portions overlap said liners within the first and second conduits respectively;
- with the first sealing portion of the bridging member located within the first conduit and overlapping the liner, expanding said first sealing portion radially so as to press the first sealing portion against the liner to form a first seal between the liner and the bridging member; and
- with the second sealing portion of the bridging member located within the second conduit and overlapping the liner of the second conduit, expanding said second sealing portion radially so as to press the second sealing portion against the liner to form a second seal between the liner and the bridging member,

whereby the liners, the first and second seals and the bridging member form a continuous barrier between the interior bore of the lined conduits and the metal of the conduit walls, wherein the dimensions of the bridging member and the sequence of the method steps are such that the material of the bridging member is not located against

the inside of the abutting ends of the conduits during at least an initial pass of said welding step.

2. A method of joining plastic-lined conduits as claimed in claim 1, wherein the ends of the lined conduits are brought together before the bridging member is introduced to the said conduits at the location of the abutting ends.

3. A method of joining plastic-lined conduits as claimed in claims 1 or 2, wherein, after at least an initial pass of welding has been performed between said conduits, the bridging member is installed via the said second conduit and subsequently expanded to form a seal between the lining of each said conduit and the bridging member.

4. A method of joining plastic-lined conduits as claimed in claims 1 or 2, wherein the bridging member is located adjacent the abutting ends of the conduits prior to starting said welding step, the outer diameter of the bridging member being sufficient to leave a substantial gap between said conduit bore at said short unlined section and said bridging member.

5. A method of joining plastic-lined conduits as claimed in claim 1, wherein at a time before the ends of the first and second conduits are brought together the bridging member is fitted to the first lined conduit and the first sealing portion is expanded to form said first seal, with said second sealing portion and part of the intermediate portion remaining outside the first conduit.

6. A method of joining plastic-lined conduits as claimed in any preceding claim, wherein at a time after said first pass of welding and after introducing the bridging member at the location of the abutting ends, said intermediate portion of the bridging member is expanded radially so as to substantially eliminate any gap between the bridging member and the inside of the abutting ends of the conduits.

7. A method of joining plastic-lined conduits as claimed in claim 6, wherein the expanding of said intermediate portion is performed prior to expanding the first and second sealing portions, to allow escape of any fluid trapped in said gap.

8. A method of joining plastic-lined conduits as claimed in claims 6 or 7, wherein the expanding of any of said intermediate portion and first and second sealing portions is performed concurrently with subsequent passes of welding.

9. A method of offshore pipeline fabrication and laying, comprising the joining of first and second conduits by the repetition of the sequence of steps as claimed in any of claims 1 to 8 to produce a continuous pipeline, each conduit being a section of pipeline added in turn to the pipeline being laid.

10. A method of offshore pipeline fabrication and laying as claimed in claim 9, wherein said first conduit is the pipe section joined already to the pipeline and the second conduit becomes the first conduit after the second conduit has been interconnected with the first conduit.

11. A method of offshore pipeline fabrication and laying as claimed in claim 9, wherein said first conduit is the one being added to said pipeline and the second conduit becomes the first conduit after interconnection.

12. A method of offshore pipeline fabrication and laying as claimed in any of claims 9 to 11, wherein each said section is less than 100m long.

13. A method of offshore pipeline fabrication and laying as claimed in any of claims 9 to 12, wherein the joining of the conduits is performed while the first and second conduits are substantially horizontal, the assembled pipeline being bent first upwardly and then downwardly for entry into the sea.

14. A method of offshore pipeline fabrication and laying as claimed in any of claims 9 to 12 wherein the joining of the conduits is performed while the first and second conduits are inclined at an angle for entry into the sea.

15. A method of offshore pipeline fabrication and laying as claimed in claim 14, wherein the method is performed upon a J-Lay vessel and the expanding of the sealing portions of the bridging member is carried out by a swaging device mounted in the head of said tower.

16. A method of offshore pipeline fabrication and laying as claimed in any of claims 13 to 15, wherein the bridging member is introduced at the location of the abutting ends after the first and second conduits have been brought together.

17. A tubular bridging member specifically adapted for use in the methods as claimed in any of claims 1 to 16.

18. A tubular bridging member as claimed in claim 17 having an outer diameter sufficient to allow free passage of the bridging member longitudinally through the lined portions of the conduits.

19. A tubular bridging member as claimed in claims 17 or 18, wherein at least one formation is provided on each sealing portion to improve the grip between the bridging member and the liner of the conduits.

20. A tubular bridging member as claimed in claim 19, wherein said formation comprises a series of circumferential formations to improve the grip between the bridging member and the liner of the conduits.

21. A tubular bridging member as claimed in any of claims 17 to 20, wherein the end of the bridging member is chamfered to aid insertion of said bridging member into the lined conduit.

22. An expansion tool specifically adapted for use in the methods as claimed in any of claims 1 to 16, said tool performing the expansion of portions of said tubular bridging member as claimed in claims 17 to 21.

23. An expansion tool as claimed in claim 22, further comprising a means for conveying the tool to its desired location, in use.

24. An expansion tool as claimed in claims 22 or 23, comprising a single expanding means moveable longitudinally to expand different portions of the bridging member sequentially.

25. An expansion tool as claimed in claims 22 or 23, comprising multiple independent means for expansion of said first and said second sealing portions.

26. An expansion tool as claimed in claim 25, wherein said expansion means are located to permit sealing of both portions of the tubular bridging member without disengaging said tool from said bridging member.

27. An expansion tool as claimed in any of claims 25 or 26 further comprising means for radial expansion of said intermediate portion of the tubular bridging member so as to substantially eliminate the space between the abutting conduits and the bridging member.

28. An expansion tool as claimed in claim 27, wherein said expansion of said intermediate portion and first and second sealing portions is performed concurrently with subsequent passes of welding.

29. An expansion tool as claimed in claims 27 or 28, wherein said expansion of said intermediate portion is performed by fluid injection into the region between said first and second radial expansion means.

30. An expansion tool as claimed in claim 29, wherein said first and second expanding means are operated with a restricted force to serve as sealing means during said fluid injection.

31. A method as claimed in any of claims 1 to 16, wherein the bridging member is as claimed in any of claims 17 to 21 and is located adjacent said abutting ends by means of an expansion tool as claimed in any of claims 22 to 30, said tool engaging the inside of said bridging member by a restricted force, and then at a time after said member is located, using a greater force to expand said sealing portions.

32. A pipe laying apparatus specifically adapted for joining lined pipes using any of the methods as claimed in any of claims 1 to 16, or claim 31.

33. A pipe laying apparatus specifically adapted for joining lined pipes by a method as claimed in claim 32 including an expansion tool as claimed in any of claims 22 to 30.

34. A plurality of lined metal pipe sections and a corresponding plurality of bridging members suitable for use in assembling a pipeline using any of the methods as claimed in any of claims 1 to 16, or claim 31.

35. An apparatus substantially as hereinbefore described with reference to any of figures 1 to 5, or figures 6a and 6b, of the accompanying drawings.

36. A method substantially as hereinbefore described with reference to any of figures 1 to 5, or figures 6a and 6b, of the accompanying drawings.

37. A tool substantially as hereinbefore described with reference to any of figures 1 to 5, or figures 6a and 6b, of the accompanying drawings.